# *Sec31b* Cas9-KO Strategy

**Designer: Miaomiao Cui**

**Reviewer: Lingyan Wu**

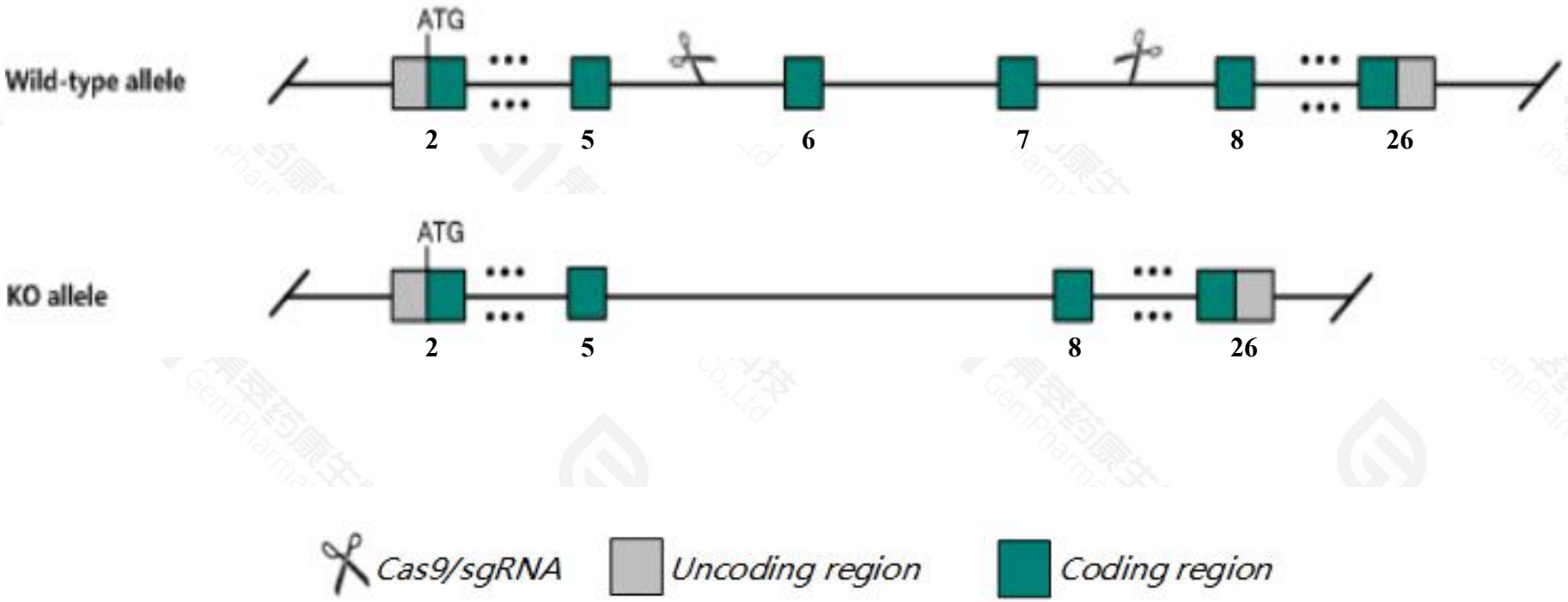
**Design Date: 2021-7-9**

# Project Overview

| | |
|---|---|
| **Project Name** | ***Sec31b*** |
| **Project type** | **Cas9-KO** |
| **Strain background** | **C57BL/6JGpt** |

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sec31b* gene. The schematic diagram is as follows:



# Technical routes

➢ The *Sec31b* gene has 3 transcripts. According to the structure of *Sec31b* gene, exon6-exon7 of *Sec31b-201*(ENSMUST00000063632.14) transcript is recommended as the knockout region.The region contains 287bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Sec31b* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6JGpt mice.Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

# Notice

➢ The *Sec31b* gene is located on the Chr19. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.

➢Transcript *Sec31b*-203 may not be affected.

➢ This strategy is designed based on genetic information in existing databases.Due to the complexity of biological processes,all risk of the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information （NCBI）

集萃药康 GemPharmatech

## Sec31b Sec31 homolog B (S. cerevisiae) [Mus musculus (house mouse)]

Gene ID: 240667, updated on 17-Nov-2020

### Summary

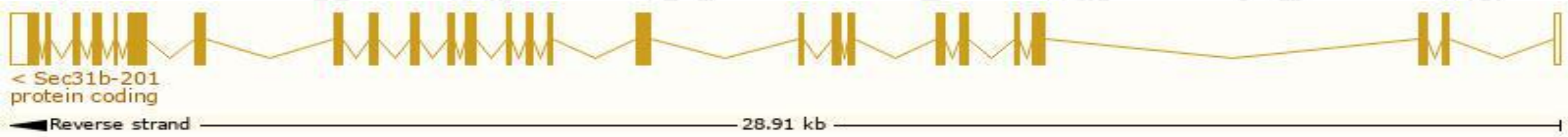
| | |
|---|---|
| **Official Symbol** | Sec31b provided by MGI |
| **Official Full Name** | Sec31 homolog B (S. cerevisiae) provided by MGI |
| **Primary source** | MGI:MGI:2685187 |
| **See related** | Ensembl:ENSMUSG00000051984 |
| **Gene type** | protein coding |
| **RefSeq status** | PROVISIONAL |
| **Organism** | Mus musculus |
| **Lineage** | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| **Also known as** | Gm341, Sec31, Sec31l2 |
| **Expression** | Broad expression in heart adult (RPKM 6.7), mammary gland adult (RPKM 5.3) and 19 other tissues See more |
| **Orthologs** | human all |

# Transcript information（Ensembl）

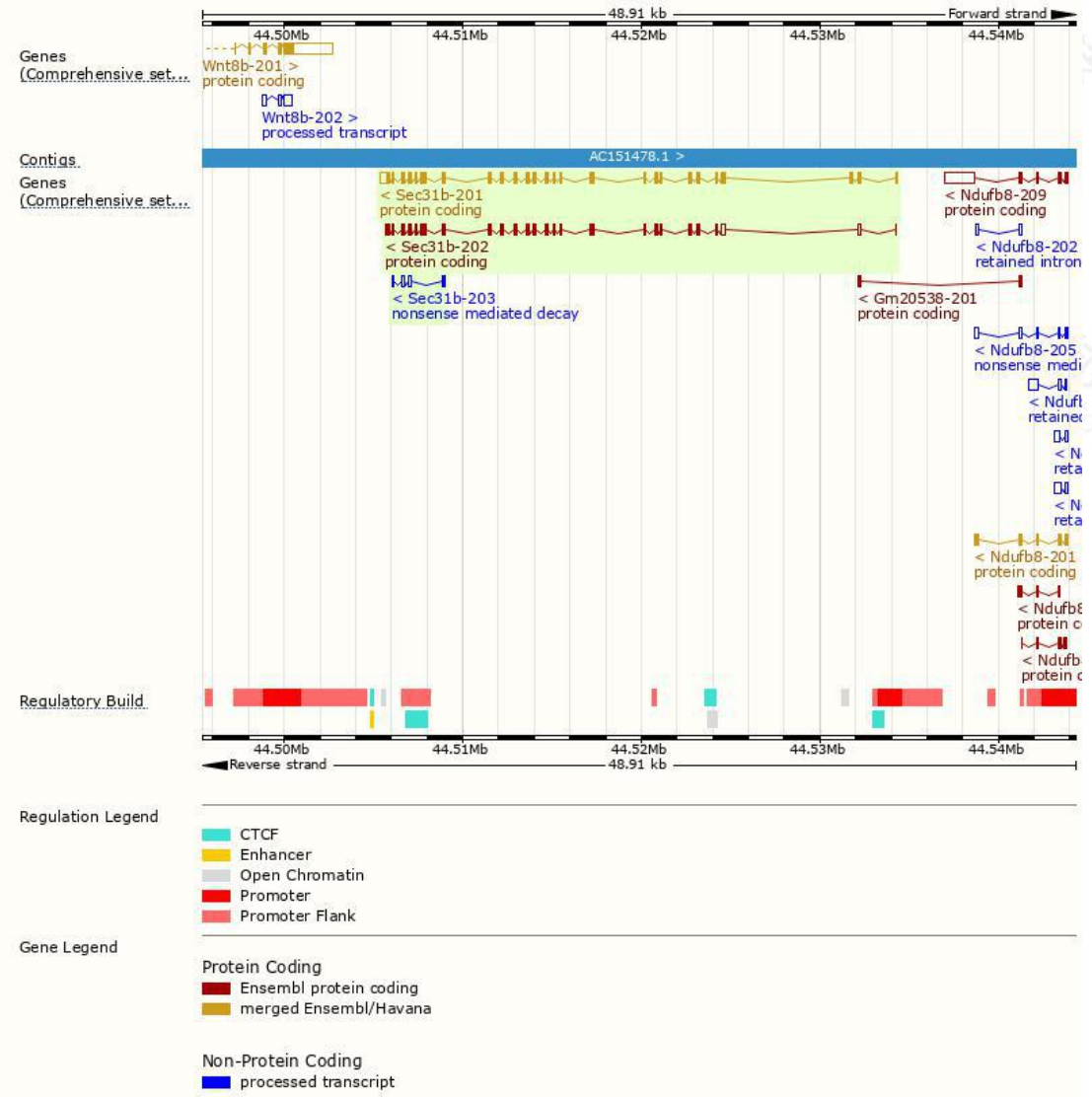
The gene has 3 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|---|---|---|---|---|---|---|---|
| **Sec31b-201** | ENSMUST00000063632.14 | 3939 | 1158aa | Protein coding | CCDS37997 | | TSL:5 , GENCODE basic , APPRIS P1 , |
| **Sec31b-202** | ENSMUST00000111985.2 | 3548 | 1001aa | Protein coding | - | | TSL:1 , GENCODE basic , |
| **Sec31b-203** | ENSMUST00000165758.2 | 503 | 59aa | Nonsense mediated decay | - | | CDS 5' incomplete , TSL:5 , |

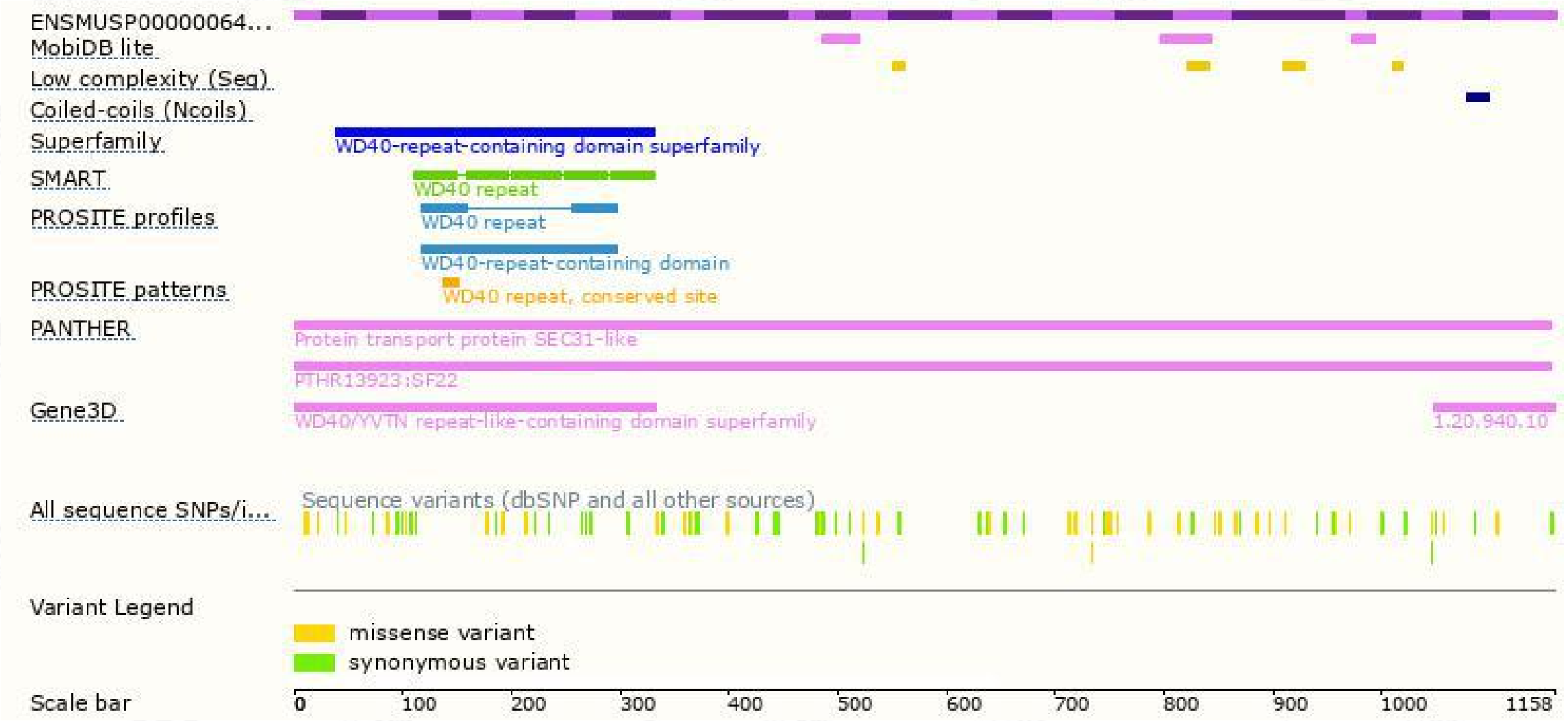
The strategy is based on the design of *Sec31b-201* transcript,the transcription is shown below:



# Genomic location distribution



# Protein domain



集萃药康
GemPharmatech

If you have any questions, you are welcome to inquire.

Tel: 025-5864 1534

集萃药康生物科技
GemPharmatech Co.,Ltd